

Space Sciences Laboratory Publication and Presentations, January 1–December 31, 1996

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NASA REPORTS

Conference Publication

1. NASA Microgravity Materials Science Conference. Conference Proceedings, Huntsville, AL, June 10–11, 1996. NASA CP–3342, October 1996. F. Szofran, D. McCauley, and C. Walker (ES75).

Technical Memorandums

1. Second United States Microgravity Payload: One Year Report. NASA TM–4737, April 1996. P.A. Curreri and D.E. McCauley (ES75).
2. Semiconductor Crystal Growth in Crossed Electric and Magnetic Fields—Center Director's Discretionary Fund Final Report (Project No. 93–25). NASA TM–108510, June 1996. M.P. Volz and K. Mazuruk (ES75).
3. The Microgravity Research Experiments (MICREX) Data Base. NASA TM–108523, Volumes I, II, III, and IV, November 1996. C.A. Winter and J.C. Jones (ES94).
4. Technology Thresholds for Microgravity: Status and Prospects. NASA TM–108526, December 1996. D.A. Noever (ES76).

Technical Papers

1. On the Importance of Cycle Minimum in Sunspot Cycle Prediction. NASA TP–3648, August 1996. R.M. Wilson, D.H. Hathaway, and E.J. Reichmann (ES82).
2. On Determining the Rise, Size, and Duration Classes of a Sunspot Cycle. NASA TP–3652, September 1996. R.M. Wilson, D.H. Hathaway, and E.J. Reichmann (ES82).
3. Prelude to Cycle 23: The Case for a Fast-Rising, Large-Amplitude Cycle. NASA TP–3654, October 1996. R.M. Wilson, D.H. Hathaway, and E.J. Reichmann (ES82).

OPEN LITERATURE

Refereed Journal Articles

1. 1100 Days of BATSE Observations of Cygnus X-1. *Astron. & Astrophys.*, 120, 153, 1996. D.J. Crary, C. Kouveliotou, J. van Paradijs, F. van der Hooft, D.M. Scott, S.N. Zhang, B.C. Rubin, M.H. Finger, B.A. Harmon, M. van der Klis, and W.H.G. Lewin (ES84).
2. Alabama's Urban Forests—Keeping Our Cities Cool. Alabama Treasured Forests, 15(4), 8–9, 1996. Published by Alabama Forestry Commission, Montgomery, AL, 1996. J.C. Luvall and D.A. Quattrochi (ES41).
3. Analytic Constraints on Gamma-Ray Burst Luminosity Functions. *Astrophys. J.*, 462, 131–135, May 1, 1996. J.M. Horack, J. Hakila, A.G. Emslie, and C.A. Meegan (ES84).
4. Analytic Solutions of the Vector Burgers' Equation. *Quart. Appl. Math.*, vol. LIV, No. 1, 63–71, March 1996. S. Nerney, E.J. Schmahl, and Z.E. Musielak (ES82).
5. Angular Power Spectrum of BATSE 3B Gamma-Ray Bursts. *Astrophys. J.*, 468, 214–224, September 1, 1996. M. Tegmark, D.H. Hartmann, M.S. Briggs, and C.A. Meegan (ES84).
6. Anticorrelated Hard/Soft X-Ray Emission From the X-Ray Burster 4U 0614–091. *Astrophys. J. Lett.*, 469, 37, 1996. E. Ford, P. Kaaret, M. Tavani, B.A. Harmon, S.N. Zhang, D. Barret, J. Grindlay, P. Bloser, and R.A. Remillard (ES84).
7. Artificial Neural Network Prediction of Tetragonal Lysozyme Face Growth Rates. *J. Cryst. Growth*, 167, 221–236, 1996. D. Noever, M.L. Pusey, E.L. Forsythe, and S. Baskaran (ES76).
8. Assessment of Rainfall Estimates Using a Standard Z-R Relationship and the Probability Matching Method Applied to Composite Radar Data in Central Florida. *J. App. Meteor.*, 35, 1203–1219, August 1996. W.L. Crosson, C.E. Duchon, R. Raghavan, and S.J. Goodman (ES41).
9. The ATLAS Series of Shuttle Missions. *Geophys. Res. Lett.*, 23(17), 2285–2288, August 15, 1996. J.A. Kay and T.L. Miller (ES41).
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11. BATSE Observations of Gamma-Ray Burst Spectra, III. Low-Energy Behavior of Time-Averaged Spectra. *Astrophys. J. Lett.*, 473, 310–321, December 10, 1996. R.D. Preece, M.S. Briggs, G.N. Pendleton, W.S. Paciesas, J.L. Matteson, D.L. Band, R.T. Skelton, and C.A. Meegan (ES84).
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13. BATSE Observations of the Large-Scale Isotropy of Gamma-Ray Bursts. *Astrophys. J.*, 459, 40–63, 1996. M.S. Briggs, W.S. Paciesas, G.N. Pendleton, C.A. Meegan, G.J. Fishman, J.M. Horack, M.N. Brock, C. Kouveliotou, D.H. Hartmann, and J. Hakkila (ES81).
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18. The Cleft Ion Plasma Environment at Low Solar Activity. *Geophys. Res. Lett.*, 23(14), 1877–1880, July 1, 1996. T.E. Moore, C.J. Pollock, M.L. Adrian, P.M. Kintner, R.L. Arnoldy, K.A. Lynch, and J.A. Holtet (ES83).
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38. Global, Collisional Model of High-Energy Photoelectrons. *Geophys. Res. Lett.*, 23(4), 331–334, February 15, 1996. G.V. Khazanov, T.E. Moore, M.W. Liemohn, V.K. Jordanova, and M.-C. Fok (ES83).
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40. Gravitational Effects on Closed-Cellular-Foam Microstructure. *J. Spacecr. and Rockets*, 33(2), 267–271, 1996. D.A. Noever, R.J. Cronise, F. Wessling, S. McMannus, J. Mathews, and D. Patel (ES76).
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45. High Resolution Passive Microwave Observations of Convective Systems Over the Tropical Pacific Ocean. *J. Appl. Meteor.*, 35(11), 1921–1947, November 1996. G. McGaughey, E.J. Zipser, and R.W. Spencer (ES41).
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8. ATMOS Measurements of H₂O+2CH₄ and Total Reactive Nitrogen in the November 1994 Antarctic Stratosphere: Dehydration and Denitrification in the Vortex. American Geophysical Union, Washington, DC, 1996. C.P. Rinsland, M.R. Gunson, R.J. Salawitch, M.J. Newchurch, R. Zander, M.M. Abbas, M.C. Abrams, G.L. Manney, H.A. Michelsen, A.Y. Chang, and A. Goldman (ES41).
9. ATMOS/ATLAS-3 Measurement of Stratospheric Chlorine and Reactive Nitrogen Partitioning Inside and Outside the November 1994 Antarctic Vortex. American Geophysical Union, Washington, DC, 1996. C.P. Rinsland, M.R. Gunson, R.J. Salawitch, H.A. Michelsen, R. Zander, M.J. Newchurch, M.M. Abbas, M.C. Abrams, G.L. Manney, A.Y. Chang, F.W. Irion, A. Goldman, and E. Mahieu (ES41).
10. ATMOS/ATLAS-3 Observations of Long-Lived Tracers and Descent in the Antarctic Vortex in November 1994. American Geophysical Union, Washington, DC, 1996. M.C. Abrams, G.L. Manney, M.R. Gunson, M.M. Abbas, A.Y. Chang, A. Goldman, F.W. Irion, H.A. Michelsen, M.J. Newchurch, C.P. Rinsland, R.J. Salawitch, G.P. Stiller, and R. Zander (ES41).

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12. BATSE-COMPTON Observatory as an All-Sky Monitor for INTEGRAL. INTEGRAL Workshop, St. Malo, France, September 1996. G.J. Fishman, B.A. Harmon, and S.-N. Zhang (ES81).
13. Calculation of Third-Order Polarizabilities of Large Molecules. 212th National ACS Meeting, Orlando, FL, August 25–29, 1996. C.E. Moore and B.H. Cardelino (ES75).
14. Calibration of MODTRAN3 With PGAMS Observational Data for Atmospheric Corrections Application. SPIE—The International Society for Optical Engineering, April 17–21, 1996. S. Schiller, J.C. Luvall, and J. Justus (ES41).
15. Cancellation of Nonlinear Absorption in Composite Materials. Optical Society of America, Rochester, NY, October 20–24, 1996. D.D. Smith (ES76).
16. Characterization of Cadmium-Zinc Telluride Crystals Grown by “Contactless” PVT Using Synchrotron Topography. 10th American Conference on Crystal Growth, Vail, CO, August 4–9, 1996. W. Palosz, D. Gillies, K. Graszka, H. Chung, B. Rahoathamacher, and M. Dudley (ES75).
17. Cities as Urban Ecosystems: A Remote Sensing Perspective. PECORA 13 Symposium, Sioux Falls, SD, August 19–22, 1996. D.A. Quattrochi (ES41).
18. Cloud-to-Ground Lightning Activity Within Tornadoic Supercells in the Tennessee Valley. 18th Conference on Severe Local Storms, San Francisco, CA, February 19–23, 1996. D. Buchler, S.J. Goodman, E.W. McCaul, and K. Knupp (ES41).
19. A Comparison of Measurements From ATMOS and Instruments Aboard the ER–2 Aircraft: Halogenated Gases. American Geophysical Union, Washington, DC, 1996. A.Y. Chang, R.J. Salawitch, H.A. Michelsen, M.R. Gunson, M.C. Abrams, R. Zander, C.R. Webster, R.D. May, J.W. Elkins, G.S. Dutton, C.M. Volk, D.W. Fahey, M. Loewenstein, J.R. Podolske, R.M. Stimpfle, D.W. Kohn, K.R. Chan, M.M. Abbas, A. Goldman, F.W. Irion, G.L. Manney, M.J. Newchurch, and G.P. Stiller (ES41).
20. A Comparison of Measurements From ATMOS and Instruments Aboard the ER–2 Aircraft: Tracers of Atmospheric Transport. American Geophysical Union, Washington, DC, 1996. A.Y. Chang, R.J. Salawitch, H.A. Michelsen, M.R. Gunson, M.C. Abrams, R. Zander, C.P. Rinsland, M. Loewenstein, J.R. Podolske, M.H. Proffitt, D.W. Fahey, K.K. Kelly, J.W. Elkins, C.R. Webster, R.D. May, K.R. Chan, M.M. Abbas, A. Goldman, F.W. Irion, G.L. Manney, M.J. Newchurch, and G.P. Stiller (ES41).
21. Computerized In Vitro Test for Chemical Toxicity Based on Tetrahymena Swimming Patterns. The Second International Conference on Environmental and Industrial Toxicology, Bangkok, Thailand, December 9–13, 1996. D.A. Noever, H.C. Matsos, R.J. Cronise, L.L. Looger, and R.A. Relwani (ES76).

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22. Computerized Monitoring of Aqueous Heavy Metal and Organic Chemical Contamination Based on Protozoa Swimming Response. The Second International Conference on Environmental and Industrial Toxicology, Bangkok, Thailand, December 9–13, 1996. D.A. Noever (ES76).
23. Containerless Processing in Reduced Gravity Using the TEMPUS Facility. AIAA, Huntsville, AL, September 24–27, 1996. J.R. Rogers (ES76).
24. Convection in an Infinite Cylinder in the Presence of a Horizontal Magnetic Field. ASME Winter Annual Meeting, Atlanta, GA, November 17–22, 1996. K. Mazuruk and N. Ramachandran (ES75).
25. Convergent Beam Macromolecular Crystallography Using Polycapillary X-Ray Optics. IUCR Meeting, Seattle, WA, August 14–16, 1996. J.B. Ullrich, S.M. Owens, Q.F. Xiao, I. Yu Ponomarev, D. Carter, R.C. Sisk, and W.M. Gibson (ES76).
26. Core Plasma Ion Temperatures From POLAR/TIDE. 1996 Huntsville Workshop, Guntersville, AL, September 1996. P.D. Craven, R.H. Comfort, D.L. Gallagher, and T.E. Moore (ES83).
27. Coronal Mass Ejection Drivers: Magnetic or Gas Pressure? A Physics Colloquium Debate at The University of Alabama in Huntsville, AL, November 1996. S.T. Suess and R.L. Moore (ES82).
28. Coronal Structure—Large and Small. Osservatorio Astrofisico di Arcetri, Firenze, Italia, September 1996. S.T. Suess (ES82).
29. Coronal Structure and the Solar Wind. Gordon Research Conference on Solar Terrestrial Physics, Henniker, NH, June 1996. S.T. Suess (ES82).
30. Crystal Growth and Optical Properties of 4-Aminobenzophenone (ABP) Crystals for NLO Applications. 10th American Conference on Crystal Growth, Vail, CO, August 4–9, 1996. R.B. Lal, H.W. Zhang, W.S. Want, M.D. Aggarwal, H.W.H. Lee, and B.G. Penn (ES76).
31. Damping of Natural Convection in Liquid Gallium With a Rotating Magnetic Field. 10th American Conference on Crystal Growth, Vail, CO, August 4–9, 1996. M.P. Volz and K. Mazuruk (ES75).
32. Detection of Urban Heat Island Development Using High-Resolution Thermal Infrared Remote Sensing. American Society for Photogrammetry and Remote Sensing/American Congress on Surveying and Mapping Annual Convention and Exhibition, Baltimore, MD, April 22–24, 1996. C.P. Lo, D. Quattrochi, and J.C. Luvall (ES41).
33. Development of a High Energy X-Ray Polarimeter for Small Satellites. 1996 Nuclear Science Symposium, Anaheim, CA, November 2–8, 1996. S. Gunji, R.A. Austin, R.F. Elsner, B.D. Ramsey, and M.C. Weisskopf (ES84).
34. Directional Solidification of Mercury Cadmium Telluride During the Second United States Microgravity Payload Mission (USMP-2). SPIE's 1996 International Symposium, Denver, CO, August 4–9. D.C. Gillies, S.L. Lehoczky, F.R. Szofran, D.A. Watring, H.A. Alexander, and G.A. Jermann (ES75).

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35. Diurnal Cycle of Lightning as Observed by the OTD: Preliminary Results for Africa. 1996 Fall Meeting of the AGU, San Francisco, CA, December 15–20. W.L. Boeck, R.J. Blakeslee, S.J. Goodman, H. Christian, D. Mach, D. Buechler, D. Boccippio, K. Driscoll, and W. Koshak (ES41).
36. Diurnal Global Lightning Distribution as Observed by the Optical Transient Detector. 1996 Fall Meeting of the AGU, San Francisco, CA, December 15–20, 1996. K.T. Driscoll, H.J. Christian, S.J. Goodman, R.J. Blakeslee, and D.J. Boccippio (ES41).
37. An Early Assessment of Science Results From the TSS–1R Mission. AIAA Conference in Huntsville, AL, September 1996. N.H. Stone (ES83).
38. Effect of Residual Accelerations During Microgravity Directional Solidification of Mercury Cadmium Telluride on the USMP–2 Mission. 10th American Conference on Crystal Growth, Vail, CO, August 4–9, 1996. D.C. Gillies, S.L. Lehoczky, F.R. Szofran, D.A. Watring, H.A. Alexander, and G.A. Jermann (ES75).
39. The Effect of Variable Biome Distribution on Global Climate. Seventh Annual Global Warming International Conference and Exp., Vienna, Austria, April 1–3, 1996. D.A. Noever, A. Brittain, H.C. Matsos, S. Baskaran, and D. Obenhuber (ES76).
40. Engineering in the 21st Century—The NASA Perspective. The Society of Women Engineers, 1996. A.F. Whitaker (ES01).
41. Estimating Ice Water Content Using Observed Lightning. 10th International Conference on Atmos. Electricity, Osaka, Japan, June 10–14, 1996. R. Ramachandran, R. Raghavan, and S.J. Goodman (ES41).
42. A Flash Discrimination Algorithm Based on the Temporal and Spatial Characteristics of Lightning Optical Pulses Observed From Space. 1996 Fall Meeting of the AGU, San Francisco, CA, December 15–20, 1996. D.M. Mach, R. Blakeslee, D. Buechler, H. Christian, K. Driscoll, S. Goodman, W. Koshak, and R. Raghavan (ES41).
43. Form and Action of the 3D Magnetic Field in Eruptive Solar Flares: Coronal Observations From the Yohkoh SXT. SCOSTEP/STEP WG–1 Workshop on Measurements and Analyses of 3D Solar Magnetic Field, Huntsville, AL, April 9–11, 1996. R.L. Moore, H.S. Hudson, J.R. Lemen, K. Shibata, T. Hirayama, and Y. Ogawara (ES82).
44. Fractal Analysis of a Flaring Active Region. SCOSTEP/STEP WG–1 Workshop on Measurements and Analyses of 3D Solar Magnetic Field, Huntsville, AL, April 9–11, 1996. M. Adams, B.A. Stark, D.H. Hathaway, and Z.E. Musielak (ES82).
45. Gamma-Ray Burst Overview. 31st COSPAR Scientific Assembly, Birmingham, U.K., July 14–21, 1996. C.A. Meegan (ES84).
46. Gamma-Ray Bursts: Observation Overview. International School of Cosmic-Ray Astrophysics, Erice, Sicily, June 16–23, 1996. G.J. Fishman (ES81).
47. GONG Observations of Solar Surface Flows. 188th AAS SPD, Madison, WI, June 6–13, 1996. D. Hathaway, P. Gilman, J. Harvey, R. Howard, J. Leibacher, J. Pintar, H.P. Jones, J. Kasher, and G.W. Simon (ES82).

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48. Graded Multilayers Not Required for Hard X-Ray Imaging! The Proceedings of "The Next Generation of X-Ray Observatories," University of Leicester, England, July 10–12, 1996. M.C. Weisskopf, R.F. Elsner, M.K. Joy, and S.L. O'Dell (ES83).
49. Ground-Based Growth of HgZnTe in a Magnetic Field. 34th AIAA Aerospace Sciences Meeting, Reno, NV, January 15–18, 1996. Y.-G. Sha, C.-H. Su, S.L. Lehoczky, and F.R. Szofran (ES75).
50. Growth and Characterization of Cadmium-Zinc Telluride Crystals Grown by Seeded PVT. 10th American Conference on Crystal Growth, Vail, CO, August 4–9, 1996. W. Palosz, M.G. George, E.E. Collins, K.T. Chen, Y. Zhang, Z. Hu, and A. Burger (ES75).
51. Growth of Semiconductor Crystals: Comparison Between the Effect of Microgravity and Magnetic Fields. Third China-Japan Workshop on Microgravity Science, Xian, China, October 2–5, 1996. P. Dold, A. Croll, F. Szofran, Th. Kaiser, M. Salk, M. Fiederle, and K.W. Benz (ES75).
52. High Altitude Aircraft Mapping of Near Surface Ocean Winds. 1996 International GEOScience and Remote Sensing Symposium (ICARSS '96), Lincoln, NE, May 27–31. R.E. Hood and R.W. Spencer (ES41).
53. High Energy Properties of X-Ray Binaries With Radio Jets. 18th Texas Symposium on Relativistic Astrophysics, Chicago, IL, December 15–20, 1996. B.A. Harmon (ES84).
54. High Spatial Resolution Airborne Remote Sensing Data for Analysis of Thermal Energy Responses Across the Huntsville, Alabama Urban Landscape. The Association of American Geographers Annual Meeting, 1996. D.A. Quattrochi, C.P. Lo, and J.C. Luvall (ES41).
55. High-Resolution Airborne Remote Sensing Data for Analysis of Day-Night Thermal Infrared Surface Energy Fluxes Within the Huntsville, Alabama, USA Metropolitan Area. European Symposium on Satellite Remote Sensing III, 1996. D.A. Quattrochi, C.P. Lo, and J.C. Luvall (ES41).
56. How Well Do PSW Retrievals Compare to NVAP Data? Second International Scientific Conference on the Global Energy and Water Cycle, Washington, DC, June 17–21, 1996. A.R. Guillory, R.J. Suggs, and J. Lerner (ES41).
57. Human Plasma Albumin: The Next Step in Structure-Based Drug Design. IUCR Meeting, Seattle, WA, August 14–16, 1996. D.C. Carter (ES76).
58. Hydrogen Budget of the Stratosphere Inferred From ATMOS Measurements of H₂O and CH₄ (The). American Geophysical Union, Washington, DC, 1996. M.M. Abbas, M.R. Gunson, M.J. Newchurch, H.A. Michelsen, R.J. Salawitch, M. Allen, M.C. Abrams, A.Y. Chang, A. Goldman, F.W. Irion, E.J. Moyer, R. Nagaraju, C.P. Rinsland, G.P. Stiller, and R. Zander (ES41).
59. Investigation of Solvent Effect on Optical Nonlinearity of Organic Molecular Systems. SPIE, Denver, CO, August 4–9, 1996. M. Sanghadas, T. Barr, B. Wu, D. Clomenil, Y. Tong, K. Bhat, R. Clark, and B. Penn (ES76).

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60. Lightning Activity in a Tornadoic Storm Observed by the Optical Transient Detector (OTD). 18th Conference on Severe Local Storms, San Francisco, CA, February 19–23, 1996. D.E. Buechler, R.J. Blakeslee, H.J. Christian, R. Creasey, K. Driscoll, S.J. Goodman, and D.M. Mach (ES41).
61. Low Altitude Trapped Radiation Model Using TIROS/NOAA Data. COSPAR, Birmingham, U.K., July 14–21, 1996. S.L. Huston, G.A. Kuck, and K.A. Pfitzer (ES84).
62. Magnetic Damping of Convective Flows During Semiconductor Crystal Growth. High Magnetic Field Workshop, Tallahassee, FL, February 27–March 1, 1996. M.P. Volz, F.R. Szofran, D.A. Watring, D.C. Gillies, C.-H. Su, and S.L. Lehoczky (ES75).
63. Materials Science in Low Gravity. SPACE 96, Fifth International Conference and Exposition on Engineering, Construction, and Operations in Space, Albuquerque, NM, June 1–6, 1996. P.A. Curreri, R.S. Snyder, and S.L. Lehoczky (ES75).
64. Microflaring in Sheared Core Magnetic Fields and Episodic Heating in Large Coronal Loops. 188th AAS SPD, Madison, WI, June 6–13, 1996. J.G. Porter, D.A. Falconer, R.L. Moore, K.L. Harvey, D.M. Rabin, and T. Shimizu (ES82).
65. Modeling of Convection and Segregation During HgCdTe Direction Solidification With Emphasis on Coupling With Crystal-Melt Interface Alteration. The 10th American Conference on Crystal Growth, Vail, CO, August 4–9, 1996. D.C. Gillies, D.A. Watring, and S.L. Lehoczky (ES75).
66. Modeling of Directional Solidification of HgCdTe Including Double-Diffusion in the Melt and Interface Curvature Prediction Using Material Phase Diagram. Materials Research Society 1996 Fall Meeting, Boston, MA, December 2–6. A.V. Bune, D.C. Gillies, S.L. Lehoczky, and H.A. Alexander (ES75).
67. MSG: Microgravity Science Glovebox. SPIE Conference on Space Processing of Materials, Denver, CO, August 4–9, 1996. C.R. Baugher, N. Ramachandran, and W. Roark (ES75).
68. Multi-center Airborne Coherent Atmospheric Wind Sensor (MACAWS). Second International Airborne Remote Sensing Conference and Exhibit, Ames Research Center, CA, June 23–27, 1996. J. Rothermel, R.M. Hardesty, and R.T. Menzies (ES41).
69. Multi-User Facility for Protein Crystal Growth in Microgravity: Results From PCAM and DCAM. IUCR Meeting, Seattle, WA, August 14–16, 1996. D.C. Carter, P.D. Twigg, B. Wright, J.X. Ho, K. Lim, J. Chapman, and T. Miller (ES76).
70. The Mystery of Gamma-Ray Bursts. Auburn University, Physics Department, Auburn, AL, May 10, 1996. G.J. Fishman (ES81).
71. The Mystery of Gamma-Ray Bursts. Presented at a Colloquium at Washington University, St. Louis, MO, 1996. G.J. Fishman (ES81).
72. NASA Strategy for Windows NT Domains. Microsoft Conference, San Diego, CA, November 4–7, 1996. T. Hudson, M. Dowdy, and T. Baldrige (ES91).

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73. NDVI and Thermal Irradiance of Urban Land Cover Types: Spatial Modeling of Urban Heat Island Effects in Huntsville Using High-Resolution Thermal Infrared Remote Sensing. The Association of American Geographers Annual Meeting 1996. C.P. Lo, D.A. Quattrochi, and J.C. Luvall (ES41).
74. New Developments in X-Ray Detector Systems. 50th Anniversary of Tata Institute of Fundamental Research, Bombay, India, August 12–17, 1996. B.D. Ramsey (ES84).
75. Nonlinear Optical Properties of Vapor Deposited Metal-Free Phthalocyanine Thin Films. American Chemical Society National Meeting, Princeton, NJ, August 25–29, 1996. H.A. Abdeldayem, D.O. Frazier, B.G. Penn, W.K. Witherow, C. Banks, A.D. Shields, R.M. Hicks, and P.R. Ashley (ES76).
76. Nonlinear Saturation Dynamics for Genetic Algorithms. International Conference on Artificial Intelligence Methods, Las Vegas, NV, June 1996. D.A. Noever and S. Baskaran (ES76).
77. Novel Methods for Detecting Environmental Toxins. The Second International Conference on Environmental and Industrial Toxicology, Bangkok, Thailand, December 9–13, 1996. D.A. Noever (ES76).
78. Observational Status of the Black Hole Binaries: What High Energy All-Sky Monitors Can Reveal. Low/Medium Energy Gamma Ray Astrophysics Mission Workshop, Lansdowne, VA, B.A. Harmon (ES84).
79. Observations of Dayside Aurora. 1996 Huntsville Workshop, Guntersville, AL, September 1996. J.F. Spann, G.K. Parks, M.J. Brittnacher, R. Elsen, L. Chen, G.A. Germany, D. Lummerzheim, and M. H. Rees (ES83).
80. Observations of Gamma-Ray Bursts. Joint APS/AAPT Meeting, Indianapolis, IN, May 2–5, 1996. C.A. Meegan (ES84).
81. Observations of Shallow Supercells During a Major Tornado Outbreak Spawned by Tropical Storm Beryl. 18th Conference on Severe Storms, San Francisco, CA, February 19–23, 1996. M. Cammarata, E.W. McCaul, and D. Buechler (ES41).
82. On the Assessment and Uncertainty of Atmospheric Trace Gas Burden Measurements With High Resolution Infrared Solar Occultation Spectra From Space. American Geophysical Union, Washington, DC, 1996. M.C. Abrams, A.Y. Chang, M.R. Gunson, M.M. Abbas, A. Goldman, F.W. Irion, H.A. Michelsen, M.J. Newchurch, C.P. Rinsland, G.P. Stiller, and R. Zander (ES41).
83. On the Distribution of Luminosity Within Cosmic Gamma-Ray Bursts. 188th American Astronomical Society (AAS) Meeting, Madison, WI, June 9–13, 1996. J.M. Horack, J. Hakkila, R.D. Preece, T.M. Koshut, and R.S. Mallozzie (ES84).
84. Polycapillary X-Ray Optics for Macromolecular Crystallography. IUCR Meeting, Seattle, WA, August 14–16, 1996. S.M. Owens, J.B. Ullrich, I. Yu Ponomarev, Q.F. Xiao, D. Carter, R.C. Sisk, and W.M. Gibson (ES76).

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85. Preliminary Ion Velocities Obtained Using Thermal Ion Dynamics Experiment (TIDE). The Huntsville Workshop, Guntersville, AL, September 1996. H.A. Elliot, R.H. Comfort, P.D. Craven, M.O. Chandler, and T.E. Moore (ES83).
86. Preliminary Performance and Results From the Ultraviolet Imager on ISTP/GGS/POLAR Satellite Preliminary. 31st COSPAR Scientific Assembly, Birmingham, U.K., July 14–21, 1996. J.F. Spann, G.K. Parks, and G.A. Germany (ES83).
87. Properties of Upflowing Ionospheric Ion Conics and Magnetosheath Proton Precipitation at 5,000 km Altitude over Cusp/Cleft Auroral Forms: Initial Observations From the TIDE and UVI instruments on POLAR. The 1996 Huntsville Workshop, Guntersville, AL, September 1996. M. Hirahara, J.L. Horwitz, G. Germany, T.E. Moore, J.F. Spann, and M.O. Chandler (ES83).
88. Remote Sensing and the Human Dimension: An Urban Ecosystem Approach. 1996 Fall Mid-South American Society for Photogrammetry and Remote Sensing UNA, Florence, AL, November 8–9, 1996. D.A. Quattrochi (ES41).
89. Removal of Oxygen From Electronic Materials by Vapor Phase Processes. 10th American Conference on Crystal Growth, Vail, CO, August 4–9, 1996. W. Palosz (ES75).
90. Rendering Three-Dimensional Solar Coronal Structures. SCOSTEP/STEP WG–I Workshop on Measurements and Analyses of the 3D Solar Magnetic Field, Huntsville, AL, April 9–11, 1996. G.A. Gary (ES82).
91. Satellite Particle Collection During Active States of the Tethered Satellite System (TSS). 27th AIAA Plasmadynamics and Lasers Conference, New Orleans, LA, June 1996. K.H. Wright, Jr., N.H. Stone, J.D. Winningham, C. Gurgiolo, C. Bonifazi, B. Gilchrist, M. Dobrowolny, F. Mariani, and D. Hardy (ES83).
92. Scintillating Optical Fiber Calorimeter (SOFCAL) Detector. SPIE's International Symposium on Optical Science, Engineering, and Instrumentation, Denver, CO, August 4–9, 1996. T. Parnell, M. Christl, and E. Roberts (ES84).
93. Seeded Growth of HgZnTe by Directional Solidification Using Initial Composition Profile Simulating a "Diffusion-Boundary" Layer. 10th American Conference on Crystal Growth, Vail, CO, August 4–9, 1996. Y.-G. Sha, C.-H. Su, and S.L. Lehoczky (ES71).
94. Short-Term Climate Variability Induced by SSI and Soil Moisture Anomalies During 1987–1988. AMS Conference on Global Ocean-Atmosphere-Land System, Atlanta, GA, January 1996. F.R. Robertson, W. Crosson, and J. Srikishen (ES41).
95. Solar Coronal Structure, Large and Small. Osservatorio Astrofisico di Arcetri, Firenze, Italia, September 1996. S.T. Suess (ES82).
96. The Solar Wind—Inner Heliosphere. International Space Science Institute (ISSI) Cosmic Ray Modulation Workshop, Bern, Switzerland, September 1996. S.T. Suess, J.L. Phillips, D.J. McComas, B.E. Goldstein, M. Neugebauer, and S. Nerney (ES82).
97. Space Station Furnace Facility. SPIE's 1996 International Symposium, Denver, CO, August 4–9. S.D. Cobb and S.L. Lehoczky (ES75).

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98. Spacecraft as Closed Ecological Systems: Theory, Reality, and Testbed. American Society of Microbiology in New Orleans, LA, May 17, 1996. A.M. Brittain (ES76).
99. The Stellar X-Ray Polarimeter. 188th Meeting of the American Astronomical Society, University of Wisconsin, Madison, WI, June 9–13, 1996. J. Tomsick, P. Kaaret, E. Ford, J. Dwyer, R. Novick, E. Silver, M. Weisskopf, R. Elsner, K. Ziock, E. Costa, and P. Soffitta (ES84).
100. Stratospheric Chlorine Partitioning: Constraints From Shuttle-Borne Measurements of HCl, ClNO₃ and ClO. American Geophysical Union, Washington, DC, 1996. H.A. Michelsen, R.J. Salawitch, M.R. Gunson, C. Aellig, N. Kaempfer, M.M. Abbas, M.C. Abrams, T.L. Brown, A.Y. Chang, A. Goldman, F.W. Irion, M.J. Newchurch, C.P. Rinsland, G.P. Stiller, and R. Zander (ES41).
101. Stratospheric NO and NO₂ Abundances From ATMOS Solar-Occultation Measurements. American Geophysical Union, Washington, DC, 1996. M.J. Newchurch, M. Allen, M.R. Gunson, R.J. Salawitch, G.B. Collins, K.H. Huston, M.M. Abbas, M.C. Abrams, A.Y. Chang, D.W. Fahey, R.S. Gao, F.W. Irion, M. Loewenstein, G.L. Manney, H.A. Michelsen, J.R. Podolske, C.P. Rinsland, and R. Zander (ES41).
102. Stratospheric Observations of CH₃D and HDO From ATMOS Infrared Solar Spectra: Enrichments of Deuterium in Methane and Implications for HD. American Geophysical Union, Washington, DC, 1996. F.W. Irion, E.J. Moyer, M.R. Gunson, C.P. Rinsland, H.A. Michelson, R.J. Salawitch, M.M. Abbas, M.C. Abrams, A.Y. Chang, M.J. Newchurch, Y.L. Yung, and R. Zander (ES41).
103. The Structural Nature of Free Fatty Acid Transport in Circulating Plasma. IUCR Meeting, Seattle, WA, August 14–16, 1996. J.X. Ho, B. Chang, K. Keeling, E. W. Holowachuk, T. Peters, and D.C. Carter (ES76).
104. Studies of Interface Demarcation and Structural Defects in Ga Doped Ge Single Crystals Using Synchrotron White Beam X-Ray Topography Materials Research Society Spring Meeting, San Francisco, CA, April 8–12, 1996. H. Chung, B. Rahoathamachar, W. Zhou, M. Dudley, M. Lichtensteiger, and D.C. Gillies (ES75).
105. A Study of Factors Limiting the Maximum Gain in Microstrip Gas Counters (MGC). 1996 IEEE Nuclear Science Symposium, Anaheim, CA, November 2–8, 1996. B.D. Ramsey, V. Peskov, and J.J. Kolodziejczak (ES84).
106. Suborbital Balloon-Borne Exposures of Cosmic Ray Experiments in Antarctica. Technical Meeting for Observing High Energy Cosmic Rays, Tokyo, Japan, October 26–27, 1996. T.A. Parnell (ES84).
107. The Super-JACEE Experiments. Technical Meeting for Observing High Energy Cosmic Rays, Tokyo, Japan, October 26–27, 1996. T.A. Parnell (ES84).
108. Surface Streamer Breakdown Mechanisms in Microstrip Gas Counters (MSGC). The Fourth International Conference on Position-Sensitive Detectors, University of Manchester, Manchester, U.K., September 9–13, 1996. V. Peskov, B. D. Ramsey, and P. Fonte (ES84).

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109. Synthesis of (2-Methoxyphenyl Methylidene) Propanedinitrile and Related Compounds. 13th Rocky Mountain Regional Meeting of American Chemical Society, Denver, CO, June 9–12, 1996. M. Romero, F. Wilson, C. Townsend, T. Myers, T. Parham, S. McCall, and B. Penn (ES76).
110. Synthesis of 4-(N,N-Dimethylamino)-3- Dodecylamidonitrobenzene. 13th Rocky Mountain Regional Meeting of American Chemical Society, Denver, CO, June 9–12, 1996. L. Romero, B. Penn, and R. D. Clark (ES76).
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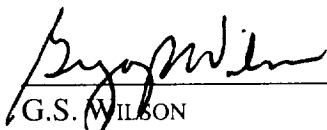
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APPROVAL

**SPACE SCIENCES LABORATORY PUBLICATIONS AND PRESENTATIONS,
JANUARY 1-DECEMBER 31, 1996**

Compiled by F.G. Summers

The information in this report has been reviewed for technical content. Review of any information concerning Department of Defense or nuclear energy activities or programs has been made by the MSFC Security Classification Officer. This report, in its entirety, has been determined to be unclassified.

A handwritten signature in black ink, appearing to read 'G.S. Wilson', is written over a horizontal line.

G.S. WILSON

DIRECTOR, SPACE SCIENCES LABORATORY

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13. ABSTRACT (Maximum 200 words) This document lists the significant publications and presentations of the Space Sciences Laboratory during the period January 1–December 31, 1996. Entries in the main part of the document are categorized according to NASA Reports (arranged by report number), Open Literature, and Presentations (arranged alphabetically by title). Also included for completeness is an Appendix (arranged by page number) listing preprints issued by the Laboratory during this reporting period. Some of the preprints have not been published; those already published are so indicated. Most of the articles listed under Open Literature have appeared in refereed professional journals, books, monographs, or conference proceedings. Although many published abstracts are eventually expanded into full papers for publications in scientific and technical journals, they are often sufficiently comprehensive to include the significant results of the research reported. Therefore, published abstracts are listed separately in a subsection under Open Literature. Questions or requests for additional information about the entries in this report should be directed to Gregory S. Wilson (ES01; 544-7579) or to one of the authors. The organizational code of the cognizant SSL branch or office is given at the end of each entry.				
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